

Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/GB05/000065

International filing date: 12 January 2005 (12.01.2005)

Document type: Certified copy of priority document

Document details: Country/Office: GB
Number: 0414563.7
Filing date: 29 June 2004 (29.06.2004)

Date of receipt at the International Bureau: 02 March 2005 (02.03.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse



INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

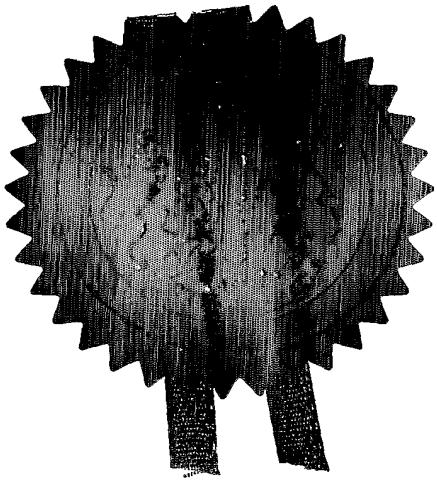
I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.



Signed

Dated 22 February 2005

$$v = \frac{1}{2} \omega^2 r^2 - \frac{1}{2} m^2 r^2 + \frac{1}{2} \sum_{j=1}^3 m_j^2 \frac{r^2}{r_j^2}$$



1/77
30 JUN 04 E907481-1 D02000
P01/7700 0.00-0414563.7 NDNE

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference

MCM/26760

2. Patent application number

(The Patent Office will fill in this part)

0414563.7

29 JUN 2004

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Helmet Integrated Systems Limited
Unit 3, Focus 4
Fourth Avenue
Letchworth
Hertfordshire SG6 2TU

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

8569824001

4. Title of the invention

Breathing Equipment

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

MATHYS & SQUIRE
100 Gray's Inn Road
London WC1X 8AL
United Kingdom

120 Holborn
London
EC1N 2SQ

Patents ADP number (if you know it)

1081001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:
 a) any applicant named in part 3 is not an inventor, or
 b) there is an inventor who is not named as an applicant, or
 c) any named applicant is a corporate body.
 See note (d))

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form.
Do not count copies of the same document

Continuation sheets of this form

Description 4 ✓

Claim(s) 2 ✓

Abstract 1 ✓

Drawing(s) 2 + 2 JML

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination
(*Patents Form 10/77*)

Any other documents
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

MATHYS & SQUIRE

Date

29/6/04

12. Name and daytime telephone number of person to contact in the United Kingdom

Michael C Moir - 020 7830 0000

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.
- b) Write your answers in capital letters using black ink or you may type them.
- c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- d) If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- e) Once you have filled in the form you must remember to sign and date it.
- f) For details of the fee and ways to pay please contact the Patent Office.

Mathys & Squire
100 Gray's Inn Road
London
UK
WC1X 8AL

Your Ref. : MCM/26760

30 June 2004

PATENT APPLICATION NUMBER 0414563.7

The Patent Office confirms receipt of a request for grant of a patent, details of which have been recorded as follows :

Filing Date (See Note)	: 29-JUN-04
Applicants	: Helmet Integrated Systems Limited
Description (No. of Sheets)	: 4
Claims (No. of Sheets)	: 2
Drawings (No. of Sheets)	: 2+2
Abstract (No. of Sheets)	: 1
Statement of Inventorship (Form 7/77)	: None
Request for Search (Form 9/77)	: None
Request for Examination (Form 10/77)	: None
Priority Documents	: None
Translation of Priority Documents	: None
Other Attachments Received	: None

The application number included in the heading above should be quoted on all correspondence with The Patent Office.

Any queries on this receipt should be addressed to Janine Geran, tel. 01633 814570. All other enquiries should be directed to Central Enquiry Unit, tel. 0845 9 500 505.

Note : The above filing date is provisional and may need to be amended if the provisions of section 15(1) of the Patents Act 1977 are not met.



BREATHING EQUIPMENT

The present invention relates to breathing equipment and in particular to breathing masks, such as those worn by the pilots of military aircraft.

The pilot of a military aircraft typically wears a breathing mask which is attached by straps for, example, to a helmet. In order to provide environmental protection, it may be necessary to provide the pilot with a hood worn either under or over the helmet.

The mask has to be located within the hood so that a problem arises when connecting the mask to the helmet, in the event that the hood is worn under the helmet. If openings are provided in the hood to receive straps connecting the mask to the helmet, the openings will need to be sealed to ensure the integrity of the hood. If the seals become damaged or distorted in use, the health of the pilot may be placed at risk. Similar problems may arise in the case of breathing masks provided for use of those working in toxic atmospheres.

According to one aspect of the present invention the breathing mask has a component for location within the hood and a component for location externally of the hood, one of the components being provided or associated with a projection capable of being pressed into the material of the hood, and the other component having an opening for receiving and retaining the projection and the portion of the hood to which it is applied.

Preferably the projection has an enlarged head which, together with the portion of the hood, is retained in the opening eg. as a snap-fit. The projection may be of mushroom-like form and be provided on a face piece of the mask for reception, together with the portion of hood covering it, in an opening in a cover located on the outside of the hood. The cover is provided with fitments for attachment of straps securing the cover to the helmet. Although the opening in which the projection is received may pass entirely through the cover, it will be appreciated that the opening may be in the form of a depression in the cover, the depression having a constricted rim to grip the projection.

A problem experienced by the wearers of breathing masks is that changes of external air pressure lead to an imbalance in air pressure across the ear drum, and to discomfort for the wearer. Some way of equalising the air pressure is therefore needed and typically this is achieved by pinching the nose, clenching the lips and exerting pressure as by exhaling, a technique known as valsalva. In the case of a pilot or worker who is required to wear goggles, pinching the nose may not be practicable. The ability to pinch the nose effectively may also be restricted if thick gloves are being worn. A conventional breathing mask includes an outlet port provided with an expiratory valve which opens as the wearer exhales and through which the exhalate is vented. According to a second aspect of the invention, the port may be provided with a part which may be depressed by finger or thumb pressure to close the port. The cover may be so shaped by, for example, being dished, so as to allow the wearer to locate it with ease, even when wearing thick gloves. With the port closed, the wearer may exhale vigorously, and it is found that the effect of this is to equalise the pressure in the ear canals.

The first and second aspects of the invention need not be employed together, but either may be employed in a breathing mask without the other.

Embodiments of the above-mentioned aspects of the invention will now be described by way of example with reference to the accompanying drawings in which:-

Figure 1 diagrammatically shows a mask embodying the first aspect of the invention,

Figure 2 is an axial section through the fixing arrangement for the mask, and

Figure 3 diagrammatically shows a mask embodying the second aspect.

Referring to Figure 1, a pilot is provided with an environmental protection hood 3 worn under a helmet 4. A breathing mask incorporates a face piece which is worn under the hood (and not visible in Figure 1) and a cover 2 which is worn externally of the hood and is connected to the helmet by strapping, 5 and a bayonet fitting 5a which is retained in a

receiver 5b attached to the helmet 4, as for example in GB 2313399. A hose 6 supplies air to the face piece of the mask.

The face piece is secured to the cover by an arrangement incorporating a stud 1 provided on the face piece and capable of inter-fitting with an opening 7 in the cover. The stud is of mushroom-like shape and has an enlarged head as shown in Figure 2 so as to be a snap-fit in the opening, with the material of the hood trapped between the stud and the cover. The stud may be readily snapped into the opening and released from it, but reliably secures the two parts of the mask when interlocked with it.

Referring now to Figure 3, a breathing mask is provided with an expiratory valve having an outlet port 10 covered by a finger piece 9. The construction of the valve may be as described in UK Patent Application No. 0311338.8, but may alternatively be of any suitable known type. It is arranged to close as the wearer inhales, and to open as the wearer breathes out. When in its normal position the cover 9 does not interfere with this manner of operation but may be depressed to close the port 10 when it would normally be open.

In order to ease discomfort in the ears, the wearer of the mask may use the finger piece 9 to close the port and at the same time endeavour to exhale strongly. Exhalation is prevented due to the port 10 being closed, resulting in elevated pressure in the wearer's respiratory system, thereby equalising or at least reducing the pressure difference across this ear drums. The wearer then releases the finger piece.

The finger piece may take the form of a cover for the outlet port retained by a central spigot 11 and arranged to close the port when depressed. Alternatively the finger piece may be coupled to the valve and serve to over-ride and close it when it would normally be open. The finger piece may be so shaped as to be easily identifiable by touch, as by being dished.

Each feature disclosed in this specification (which term includes the claims) and/or shown in the drawings may be incorporated in the invention independently of other disclosed and/or illustrated features.

The text of the abstract filed herewith is repeated here as part of the specification.

A breathing mask has a face piece to be worn within a hood 3 and a cover 2 to be worn outside the hood, and a stud 1 for attaching the face piece to the hood. The stud is pressed into but not through the material of the hood, and both are retained in a clip formed in the cover 2 externally of the hood. According to a second aspect, a breathing mask has an outlet port capable of being closed by the wearer in order to allow him to equalise pressure in the ear canals.

CLAIMS

1. A breathing mask for use with a helmet and a hood worn within the helmet, the mask including a component for location within the hood and a component for location externally or the hood, one of the components being provided or associated with a projection capable of being pressed into the material of the hood, and the other component having an opening for receiving and retaining the projection and the portion of the hood to which it is applied.
2. A breathing mask as claimed in Claim 1, wherein the projection has an enlarged head which is shaped to be retained in the opening.
3. A breathing mask as claimed in Claim 2, wherein the opening is defined by resilient material so that the projection is a snap-fit therein.
4. A breathing mask comprising a face piece to be worn within a hood and a cover to be worn externally of the hood and attachable to the helmet, the face piece being provided or associated with a stud with an enlarged head, the stud being retainable within an opening in the cover with a portion of the hood trapped between the stud and the cover.
5. A breathing mask having an outlet port, a valve associated with the outlet port, the valve opening when a wearer of the mask exhales, and means operable by the wearer for closing the port when the wearer exhales.
6. A breathing mask as claimed in Claim 5, wherein said means comprises a cover for the port, the cover being capable of being depressed or otherwise moved manually to close the port.
7. A breathing mask, as claimed in Claim 6, wherein the cover is so shaped as to be

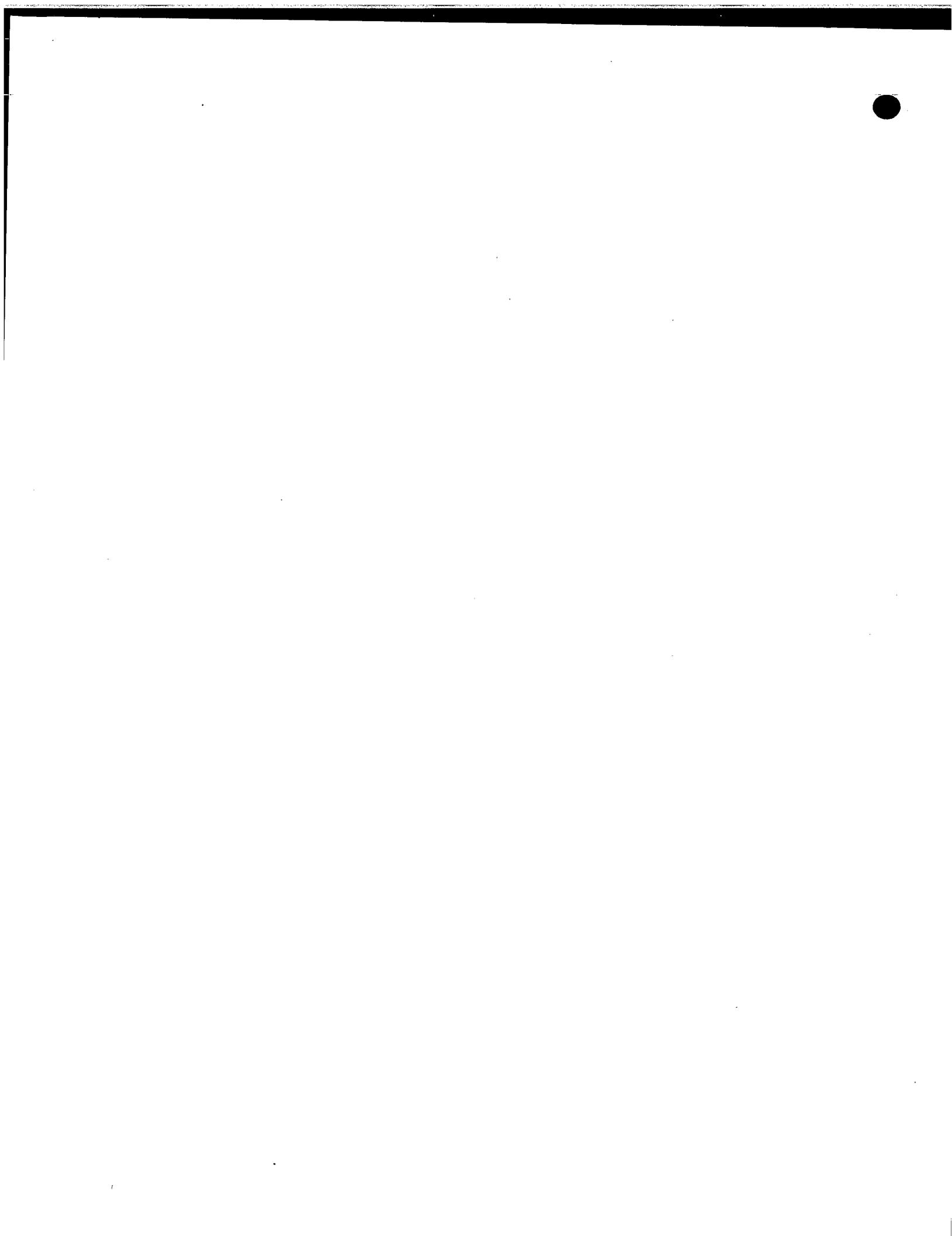
readily identifiable by touch.

8. A breathing mask having an outlet port capable of being closed by the wearer at will.
9. Breathing apparatus substantially as hereinbefore described with reference to and as illustrated in Figures 1 and 2 or Figure 3 of the drawings.

ABSTRACT

A breathing mask has a face piece to be worn within a hood 3 and a cover 2 to be worn outside the hood, and a stud 1 for attaching the face piece to the hood. The stud is pressed into but not through the material of the hood, and both are retained in a clip formed in the cover 2 externally of the hood. According to a second aspect, a breathing mask has an outlet port capable of being closed by the wearer in order to allow him to equalise pressure in the ear canals.

(figure 1)



11/2

FIG 1

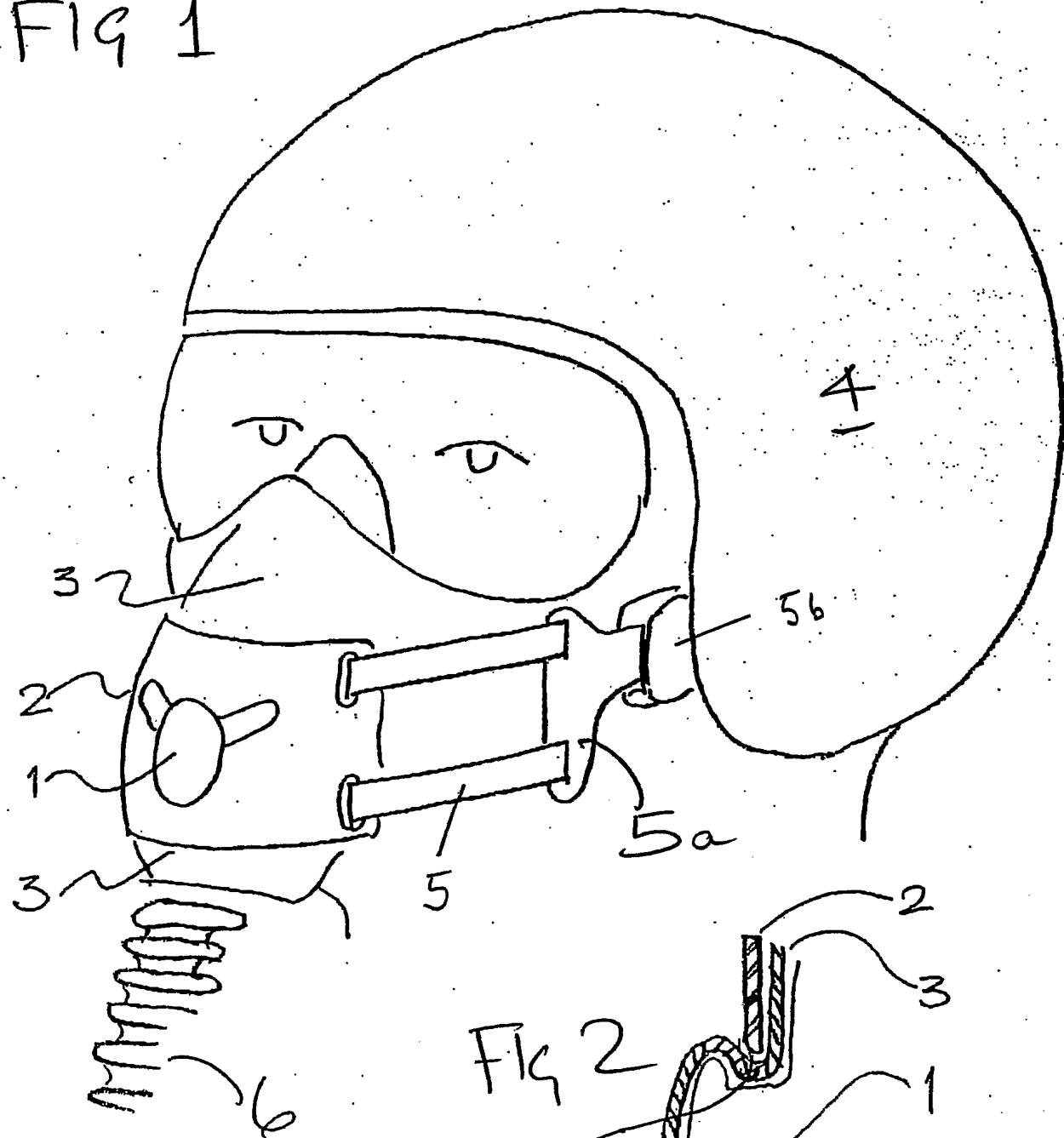
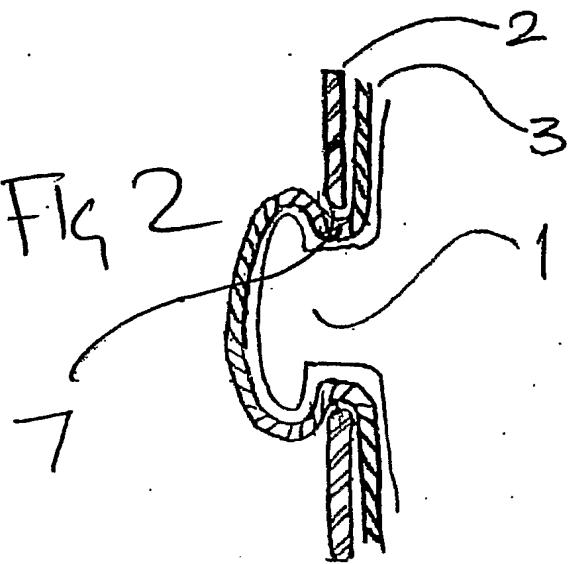
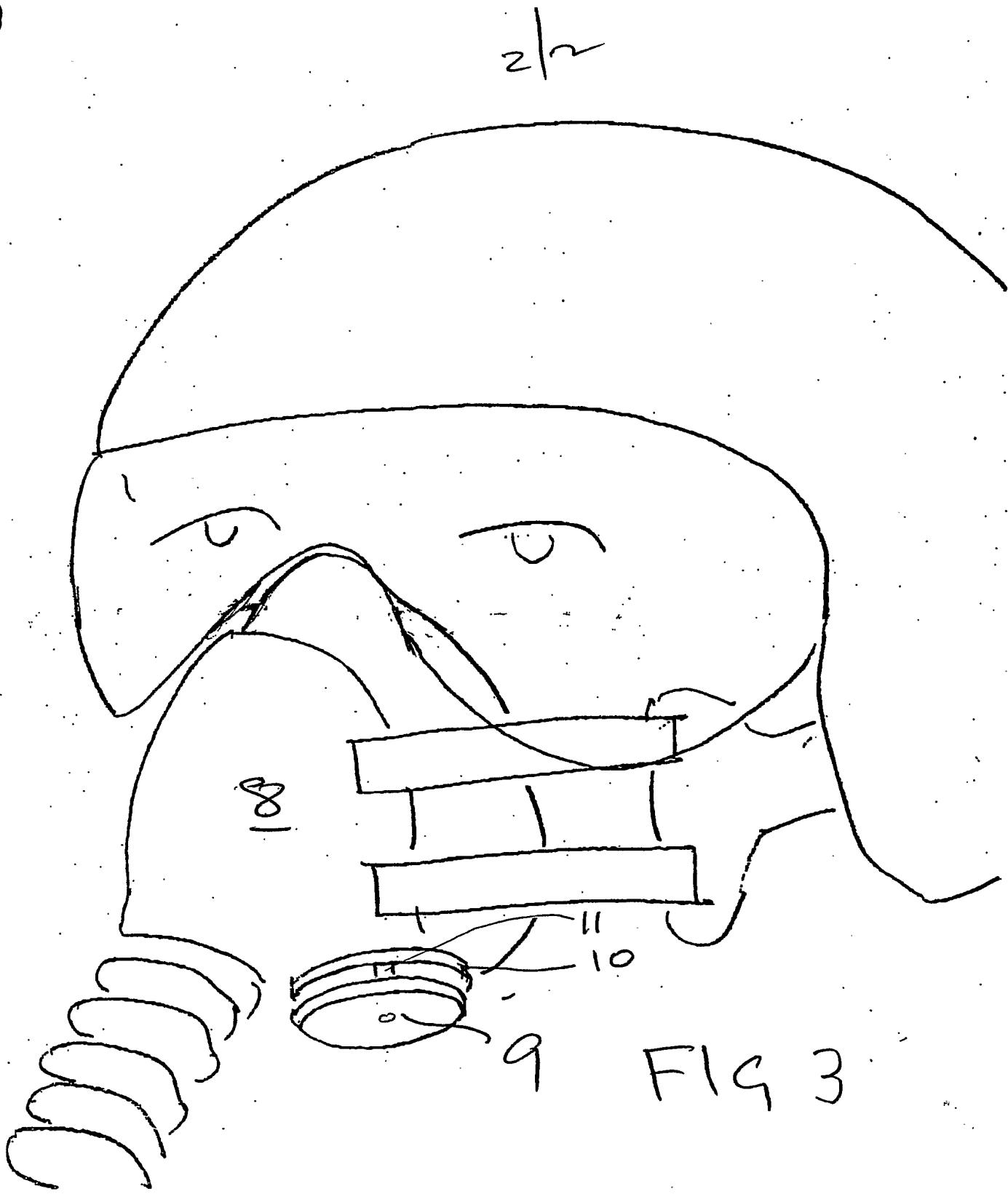


FIG 2







9 FIG 3

